# Old-Time New England

THE BULLETIN OF

## The Society for the Preservation of New England Antiquities

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**Gravestone of Michael Barstow, 1698**

OLD BURYING GROUND, WATERTOWN, MASS.

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**The Society for the Preservation of New England Antiquities**

A QUARTERLY MAGAZINE
DEVOTED TO THE ANCIENT BUILDINGS, HOUSEHOLD FURNISHINGS, DOMESTIC ARTS, MANNERS AND CUSTOMS, AND MINOR ANTIQUITIES OF THE NEW ENGLAND PEOPLE

*Volume* XVI JULY, 1925 *Number* 1


## The Old Burying Ground at Watertown, Mass.

By Wilfred A. Norris

PERHAPS no burial ground in New England contributes more to perpetuate the memories of the founders of our Republic and the struggles and privations endured in their efforts to secure civic independence and religious toleration than the old burying ground in Watertown.

In 1642, according to the earliest records, the town ordered "That Hugh Mason, Thomas Hastings and John Sherman are appointed to set a sufficient [fence] about the Burying Ground —with a five foot pale," etc. This has reference without doubt to the subject of this article, and one would infer from the record that interments had been made prior to the above order, even as far back as the first settlement of the town in 1630.

In Bond's "History of Watertown," appears the following: "Let the visitor who has been admiring the costly, tasteful memorials in Mount Auburn Cemetery extend his excursion half a mile farther westward, and he may find graves decayed, and ancient grave stones sunken or dilapidated and overgrown with weeds and brambles, where were buried the Puritan ancestors of some of the builders of these admired monuments."

Many Watertown men took part in the numerous conflicts which disturbed the newly developing colonies, and among the persons interred here were a large number of those most distinguished of the early settlers of the old town, and also the progenitors of many now living here or dispersed throughout the land. Many a hero and patriot no doubt sleeps here in a nameless grave. Although Watertown was settled in the year 1630, it was not until twelve years later that any record was made of interments, and these are incomplete and fragmentary.

The burying ground is enclosed at present by a low stone wall, separating it on the north from Mount Auburn Street, "The great highway leading from Waltham to Boston;" on the west by Arlington Street and on the east and south by the Coolidge farm, one of the few remaining old-time market gardens.

As one enters the enclosure from the west gate, he is confronted on every side by ancient headstones with curious epitaphs. In contrast with modern cemeteries, there are no carefully laid out paths, or sign posts, and no evidence of system or regularity, except

**Gravestone of Hannah Barron, 1683**

OLD BURYING GROUND, WATERTOWN, MASS.

**Gravestone of John Livermore, 1684**

OLD BURYING GROUND, WATERTOWN, MASS.

**Gravestone of Samuel Livermore, 1690**

OLD BURYING GROUND, WATERTOWN, MASS.

**Gravestone of Robert Harrington, 1707**

OLD BURYING GROUND, WATERTOWN, MASS.

a most interesting and unusual feature that all tombs and headstones face toward the setting sun. While many of the stones are erect and well preserved, with the lettering and carving clear-cut and distinct, others are leaning this way and that, some broken beyond repair and many gray and aged stones are sinking into the earth. It is more than guesswork that for every old gravestone now to be seen, many more have disappeared. A sturdy upright stone attracts one's attention and upon close inspection it is found to be partly imbedded in the trunk of a large tree, which was evidently a small sapling when the gravestone was put in place. The date is July 8, 1785. The most noticeable tomb in the cemetery is marked by a plain granite shaft of simple design, erected to the memory of Joseph Coolidge, the only Watertown man killed in the Battle of Lexington, April 19, 1775. He was a thrifty, independent farmer, who, when the alarm came, took his gun and powder horn, joined the Minute Men, en route, and lost his life the same day in a skirmish with the retreating British. He was forty-five years old at the time of his death. His body was recovered, put in a farm cart, and brought back to Watertown by his son.

Near the corner of Mt. Auburn Street, and within a few feet of the outer wall, lies the dust of the first generation of the Coolidge settlers, the acknowledged progenitors of President Calvin Coolidge. The two graves of John and Mary Coolidge are marked by simple slate stones identically alike in pattern and carvings, well preserved and with lettering clear cut and distinct. They died but a few months apart in the year 1691.

In a central location may be found one of the oldest and most interesting graves, that of Mehetable Gearfield, wife of Benjamin Gearfield (Garfield). She died in 1675. Ex-President Garfield was a descendant and was desirous of visiting the grave at the time of his assassination. Records show that Edward Garfield was prominent in town affairs, as early as December 30, 1637.

The stone bearing the oldest date is that of Sarah Haman (Hammond), 1674. A small stone, broken and age-worn, but the inscription is clear and distinct.

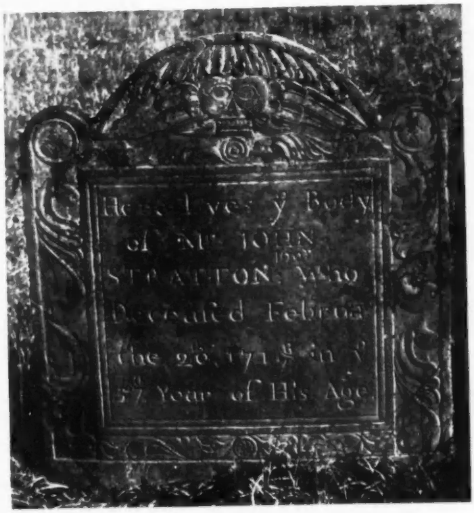
Near the Coolidge monument is the tomb of Moses Coolidge, a Revolutionary soldier, who served at Dorchester Heights. Markers are placed here on Decoration Day at the monument and at the graves of Col. Christopher Grant, and of Frederick Sherman, a veteran of the Civil War.

Among the many quaint inscriptions are those upon the tombs of Thomas Bailey and his wife Lydia, which lie side by side.

Here lies ye precious dust of Thomas Bailey, A Painful Preacher, An Exemplary Liver, A Tender Husband, A Careful Father, A Brother in Adversity, A Faithful Friend, A Most Desirable Neighbor, A Pleasant Companion, A Common Good, A Cheerful Doer, A Patient Sufferer, Lived much in little time, A Good Copy for all Survivors. Aged 35 years, Slept in Jesus, January 21, 1688.

The inscription on his wife's tomb reads as follows:

Pious Lydia, Made and Given by God as a most meet help to Thomas Bailey, Minister of ye Gospel, Good betimes, and Best at Last, Lived by Faith, and Dyed in Peace, Went off Singing, Left us Weeping, Walked with God, till Translated in Ye 39 Years of Her Age, April ye 16, 1691. Read her Epitaph in Prov. 31 ,10, 11, 12, 28, 29, 30, 31.

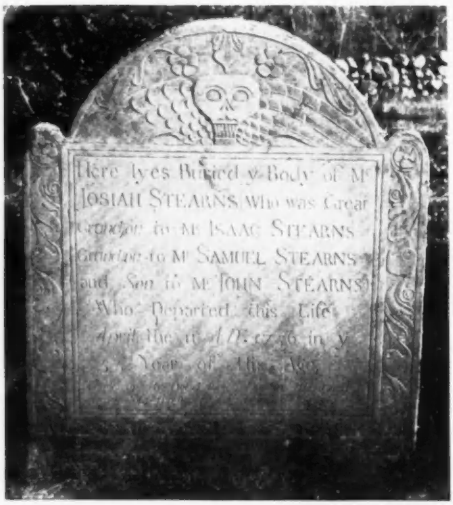



**Gravestone of John Stratton, Jr., 1718**

OLD BURYING GROUND, WATERTOWN, MASS.

**Gravestone of Mrs. Elizabeth Beeres, 1718**

OLD BURYING GROUND, WATERTOWN, MASS.




**Gravestone of Josiah Stearns, 1756**

OLD BURYING GROUND, WATERTOWN, MASS.

**Gravestone of Thomas Whitemore, 1717**

OLD BURYING GROUND, WATERTOWN, MASS.

A few feet away is the tomb of Captain William Shearer, with a slate slab, broken and rudely held in place, the legend somewhat defaced, evidently a mark of vandalism.

On rising land near the west wall, may be seen the Richardson-Bright tomb, where interments were made (from 1808 to 1876) of the remains of the Richardson, Bright, Robinson, and Park families.

A few feet away is the Bird tomb, and here are deposited not only the remains of the progenitors, but also the well-beloved Bird Family of singers, well known in the 80's.

We now come to the tomb of the Coolidges where interments were made from 1784 to 1881. This is marked by a thick slate slab elevated above the ground on stone posts.

Close by is the tomb of John Sherman, one of the early ministers of the Parish, who died in 1685. The inscription is in Latin.

A tomb which attracts a great deal of attention is that of Jonas Bond who was prominent in the ministry and in civic and military life. His epitaph reads:

Here lies buried ye Body of Jonas Bond, Esq., Who Was Called by God To Serve ye Public, Both as a Lieutenant Colonel of a Regiment of Militia, and a Justice of the Peace; and was careful to Discharge his Trusts with Fidelity, Zeal, and Courage, Who was a Man of Unaffected Piety Which was Attended with all Those Virtues, that are Requisite to Accomplish a Christian, who was a Kind Husband, a Tender Father, A Steady Friend, and a Hearty Lover of Good Men, and Having Served his Generation, by the Will of God, Fell on Sleep April 21, Anno Domino 1727 Aetatis Sua—63.

The inscription on the tomb of the Rev. Henry Gibbs is in Latin. He was a graduate of Harvard and was ordained in Watertown in 1697. He died in 1723; one of the many notable ministers buried here.

The grave of Jonathan Child, Preacher, occupies a prominent position in the enclosure. His many good qualities are recorded upon his tablet.

Other graves of especial interest are those of Captain Hugh Mason, a training officer in the militia, and prominent in civic life in the community; of Joseph Tainter "who sailed from England June, 1636, and departed his life Feb. 20, 1690"; of William Shattuck, the progenitor of the race that has borne his name in America; and many others that interest not only the antiquarian, but also those who take a real interest in the traditions and cherish the memory of the early settlers of New England.

As one wanders through these consecrated grounds trampled by the feet of many generations, he is pained at the sight of so many rude and time-effaced stones that are still standing—uncared for relics of the past.

An old battered stone has this inscription:

Upon Ye Death of Ye
PIOUS MATRON

She lived a pious holy Godly life
Being now escaped free from hate and strife

Another epitaph reads:

Elizabeth Barsham Consort to ye late Capt. Barsham, Who departed this Life December 23, 1729, ye 74th Year of Age, after She had long Abounded in Acts of Sobriety, Righteousness and Piety.

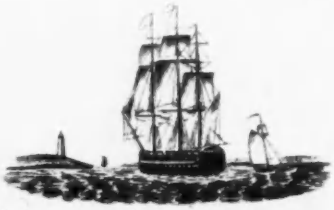
In marked contrast, many epitaphs are principally constructed to impress the eye and stimulate the imagination of the looker-on, while others show horrible images of death, executed by incapable designers, surrounded by rude emblems and flowers in false taste.

REWARD

This Certifies that [illegible] by diligence & attention to his studies merits my approbation [illegible]

OF MERIT

REWARD OF MERIT



This Certifies that [illegible] by diligence & attention to his studies merits my approbation [illegible]

REWARD OF MERIT

APPROBATION

This Certifies that [illegible] by diligence and good behaviour, merits the approbation of his Instructor [illegible]

APPROBATION

# Old-Time "Rewards of Merit"

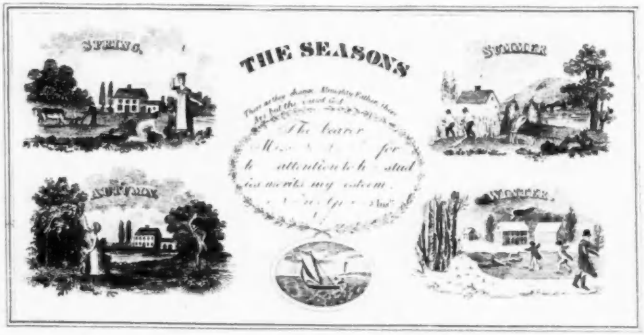
By Hattie Elliott Johnson

A "REWARD of Merit!" Holding this silent bit of cardboard in my hand, memory starts a train of thought back to childhood days when annual visits to my maternal grandparents meant the unlimited luxury of doing as I pleased, especially in their never-to-be-forgotten attic, which was filled with the accumulations of many years of thrifty and frugal New England habits, when nothing was ever really lost or destroyed.

From the storehouse of chests in this attic came gowns, hoop-skirts, bonnets, gloves, and other articles of wearing apparel, in which it was a joy to bedeck myself, and with childish imagination rampant I temporarily became some important personage of the past or present and paraded around in grand and solitary pomp. A favorite impersonation was that of the village school-mistress, who, by her high and mighty use of the ferrule and her emphasizing of instruction with resounding whacks of a rattan on the schoolroom blackboard, had won my admiration. It was while under the spell of impersonating this teacher that I became acquainted with old-time rewards of merit.

First, the various pieces of discarded furniture were satisfactorily arranged to serve as pupils for instruction, to whom I pounded out my authority on a couple of ruined family portraits that had at some time been relegated to the upper regions because a misguided relative of the past decided to try his luck at landscape painting. Then I would solemnly open the carefully kept boxes of "Rewards of Merit"—cherished possessions of at least two generations—and with discriminating hand dole them out to my imaginary pupils. These boxes contained "Rewards of Merit" for all occasions—the daily, weekly and monthly cards, and even the very large and elaborate "end of the term" cards. In types and styles they were interesting and varied, including "cut-outs," black and white prints, embossed cards, cards made by teachers on colored pieces of paper and "written in," as well as others beautifully hand-drawn and illuminated in gold and colors, and many that were gaily and handsomely colored. They all bore the words "Reward of Merit," and had spaces left for dates, signatures and what the rewards stood for, and on many, a space for the name of the recipient.

It is related by one who attended school in the primary grades of about 1845 how the teacher gave out each day at the close of school a bit of paper with the words "Perfect," "Not Absent," or "Good Behavior" written upon it. When ten of these bits of paper had been acquired by a pupil they were exchanged for a larger card in black and white, something like a receipt. Later, at the close of school, the "end of the term" card—a sort of prize award—was given. These latter were glazed cards with gaily colored flowers, birds, animals, rural scenes and figures on them. The name of the recipient, the date, and special mark-


THE SEASONS
SPRING
SUMMER
AUTUMN
WINTER

500 CENTS
5
5
FIVE DOLLS
REWARD OF MERIT.
This certifies that
by
diligence and good behaviour merits the approbation of
friends and Instructor.
5

BLESSINGS of PEACE
HORRORS of WAR.
The REWARD of
The bearer
receives this as a
token of the
merits for his diligence
and good attention to his studies in school
Inst.r

REWARD OF MERIT.
The beaver to Miss Jo: Emerson
for her diligence and attention
to her studies merits the approbation
of her teacher Sally Rea

I have no greater joy, than to hear that my children walk in the truth.—St. John.
10
Children obey your parents in the Lord, for this is right.—St. Paul.
REWARD OF MERIT.
This certifies, that Miss Harriet N. Emerson,
by diligence and good behaviour, merits the approbation of
her friends and Instructor.
Sally Rea.
Sold by Nathan Burrill, at the Haverhill Book-Store.

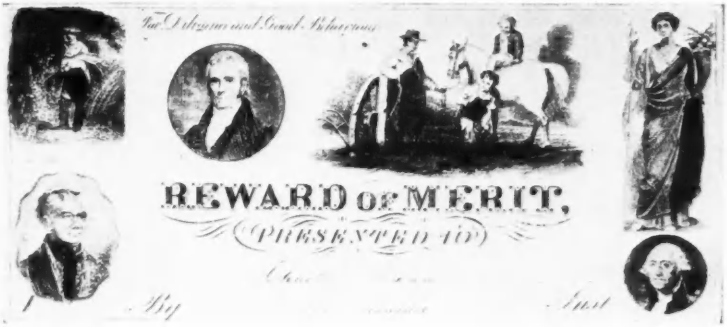
Reward of Merit
Reward of Merit
This certifies that Miss
Sarah E. Minett by diligence and good
behaviour merits the approbation of her
Friends and Instructor Jeremy Drake

ing for perfect work were written in by the teacher. In some instances the name of the school was added, also the signature of the teacher, giving to such of these cards as have come down to us of today rare interest and historical value.

The writer remembers that "Reward of Merit" cards were used in the seventies in the primary grades of both public and private schools and in the primary and intermediate grades of Sunday Schools. It was some time after 1880 that the "merit" system was abolished, except in isolated places, and a more modern system of marking instituted in cities and towns for schools of all grades.

The Sunday School "Rewards of Merit" were small, measuring about an inch and a half by three-quarters of an inch. They were of white glazed cardboard with brightly tinted biblical pictures in miniature upon them; the word "good" or "perfect" was printed across the cards in gold or black, and sometimes the words "Sunday School—Good," or "Sunday School—Perfect." When one had been "good" or "perfect" all the Sundays during one month these small cards were exchanged for a card about four and a half by two and a half inches in size. These also in most cases had biblical pictures of brilliant hues, and beside the pictures short sentences from the scriptures, with a space for the pupil's name, and on some cards a space for a date. Certain designs met with more favor among the small recipients than others, notably "Noah's Ark," "Doves of Peace," and bright colored flowers, and little fistic quarrels were often in order on the way home from Sunday School that some coveted design might be secured.

Most interesting and illuminating it was to listen to the reminiscences as lately related by a charming, frail little lady in her ninety-first year, who in 1838 attended her first Dame School in Danvers, Mass. When questioned, her recollections as to whether "Rewards of Merit" were ever distributed in this school, were overshadowed by a distinct and outstanding remembrance of a punishment which was meted out to her at a very tender age for a most trivial offence. The "guilty" child was stood in the center of the room with the teacher and scholars standing in a circle around her. The teacher, hissing, pointed her finger at the child, which action was followed in chorus by all the scholars. This was evidently considered a severe chastisement and it left a lasting, bitter sting which remains after all these years. Another mode of punishment for youthful misdemeanor was the use of the "dunce's stool," upon which the delinquent sat or stood, facing a corner or wall, and as a further humiliation a peaked cap with the word "dunce" upon it topped the small rogue's head. If, after a session or two, the pupil still remained unruly the ferrule or the flogging whip was used; suspension and expellment were the severest and final disgrace of the culprit who persisted in wrong doing. However, the unpleasant memories of this school are veiled in a happier recollection of life in another Dame School, also in Danvers, where a number of years were spent in acquiring the rudiments of learning and the "social graces of polite living." This teacher is remembered for her smile and lovely curly hair, but most particularly for her beautiful hands. It was this lady's childish desire to touch


REWARD OF MERIT,
PRESENTED TO

Reward of Merit
Presented to
By
Teacher.

TOKEN OF
APPROBATION
Presented to
as a reward for good behaviour by

# Reward of Merit.

THIS CERTIFIES

That Miss Sarah Hood

by diligence and good behaviour merits the approbation of her friends and Instructress

Mary A. Spofford

Presented to Miss Sarah Hood

By Mary A. Spofford Instructor

REWARD
OF
MERIT.

This CERTIFIES, that Miss Sarah Hood by diligence and good behaviour, merits the approbation of her Friends and Instructress Mary A. Spofford

Sold by NATHAN BURRILL, at the Haverhill Book-Store.

the small, soft, white hands of this teacher, and to this day the vision of them and the same unsatisfied desire remain. She relates how few were the books and how precious their possession, sometimes two or more pupils sharing one, and how many of the school books were "hand-me-downs." "Extras," such as drawing and painting, were luxuries for the favored few. Lessons were mostly oral. The three "R's" were assiduously studied, and mental arithmetic and spelling matches were important items in the day's work. The "art of sewing" had its due importance. Little tots were given severe tasks at a tender age, and were taught all the "fine stitches," how to cut out small garments, and also to knit and weave. With the "social graces" there was instilled into these young minds a deep reverence for their parents, the minister and for the aged.

"Rewards of Merit" are not remembered by this lady of ninety-one as having been used in either of these Dames' Schools, though she possesses an unusually fine collection which belonged to her mother, Mary Ann Nutting, who attended the Dame School of Miss Nancy Graves, in Danvers, Mass., between the years of 1814 and 1820. This collection includes not only "Rewards of Merit" of many varieties, but also India ink washes, watercolor drawings, exquisitely colored maps, and examples of fancy scroll drawing and penmanship on sheets of embossed-bordered paper, also receipts of quarterly bills for tutelage in Miss Graves' School, and compositions on various subjects. These give an excellent idea of the painstaking work accomplished in the schools of long ago.

Without doubt the system of bestowing "Rewards of Merit" in New England originated in the Dame Schools, and to those interested in this subject and the life of children of decades long since passed, we commend that most interesting book of Mrs. Alice Morse Earle's,—"Child Life in the Olden Time."

EDITORIAL NOTE:—After long years of silence comes a renewed interest on the part of our ever-inquiring public as stray "Rewards of Merit" come to light from some unexpected source—a book, a drawer, or a "treasure chest"—to remind one of the many that have been lost forever through negligence or wanton destruction. Not only to help those seeking more knowledge about the historical and pictorial side of "Rewards of Merit," but to incite the curiosity and enthusiasm of others, which should ultimately lead to the discovery of many more examples by which both public and private collections would be enriched, this sketch has been prepared, and *The Society for the Preservation of New England Antiquities* would appreciate additions to its present small collection, either from its members or other readers of this sketch. The "Rewards of Merit" shown at the top and bottom of page 16 were presented to the Society by Capt. W. B. Clarke. The others come from the collections of Mrs. Sarah M. Blanchard and the Assistant Editor.

*Courtesy Mr. John H. Webber*

**Display of Pewter at the Twentieth Century Club, Boston, at the Exhibition held in January, 1925**

All of this pewter and Britannia ware, except the plates, was made in Beverly, Massachusetts, between 1810 and 1850, by three pewterers, Israel Trask, Oliver Trask and Eben Smith. Israel Trask (1786-1867) worked at his trade in Beverly, and as the business increased employed his brothers George and Oliver. George became a minister and Oliver afterwards set up his own shop in Beverly. Eben Smith was apprenticed to Israel Trask and later engaged in business for himself. The Trasks at first made pewter, specializing in spoons, small whale-oil lamps, tankards of dull, leady alloy, and casters, the glass bottles for which probably came from the New England Glass Works at East Cambridge. During his later years Israel Trask followed the fashion of the day and made Britannia ware "duck-bodied" tea pots, that followed the lines of Sheffield pieces, and tall, straight-sided coffee pots. Among his contemporaries Israel Trask was known as the maker of "improved" and "up-to-date" table ware.

# Ancient Carpenters' Tools, Part II

By Henry C. Mercer, D.Sc.

## Tools for Moving and Measuring

THUS obtained or prepared by Axe, Frow, Wedge, or Saw, the wooden material had to be further dealt with by the tools for moving and measuring it, either at the start, or later in the wood-working process.

As the destruction of the magnificent North American forest proceeded, lumber was always necessary, and the evidence shows that some of the methods for its preliminary transport, whether by the pioneer, while exterminating trees for house room; by the later farmer, in supplying local saw mills; or the organized lumbermen, helped by river, railroad and canal, in meeting the voracious national demand for building material, have remained unchanged, until the end of the 19th century. The important but overlooked tools, that served these uses, are here shown, beginning with

### The Drag Shackle (Fig. 35)

a short chain, which, when its spurs are driven into the opposite sides of the log end, dragged the log out of the woods by means of horses attached to its ring. Otherwise a common chain would do the work with more friction.

The apparatus is called "Span Dogs" by Knight's *American Mechanical Dictionary*, 1878, also, in the *New English Dictionary* quoting 1867 for the earliest use of the word, and probably the name "Drag Prongs," of 1662, listed in the *Essex County (Mass.) Probate Records*, Vol. I, p. 395, and the word "Span Shackle," frequently there mentioned (1635 to 1681), refer to it, though neither word appears in the *New English Dictionary*.

A similar chain with similar claws was found by the writer in 1924, in use by John Wildonger, near Point Pleasant, Bucks County, Pa., and another, used *c.* 1880, by Lewis Treffinger, a carpenter of Doylestown, was given by him to the Museum there in 1925. This specimen, No. 20256, was presented by Col. H. W. Shoemaker, of McElhattan, Pa., and was made by Seth Nelson, Jr., a mountaineer woodsman, hunter and artificer of Round Island, Clinton County, Pa., about 1885.

For the pioneer or the farmer of the 18th century, the drag shackle sufficed to drag logs, one by one, or, if small, laid sidewise two by two; but when later at the final funeral of the forest, organized bands of lumbermen strung dozens of logs together and dragged them wholesale with horses or oxen down the mountain sides, variations of the tool became necessary. These fatal spurs, together with the more common harness chains for directly pulling the felled tree, or fastening it upon the wagons and sleds, shown later, are herewith grouped together and illustrated as

### Log Grabs and Log Chains (Fig. 36)

Mr. A. J. Marschner, mill owner, of Roulette, Pa., and lumberman of the 80's, explains them as follows: namely (*a* and *b*), the single and double trailer grab—a short two- or four-clawed swivelled chain for dragging logs by the dozen or more yoked

**Fig. 35.—The Drag Shackle**

Called "crotch grabs" by Pennsylvania mountain lumbermen in the nineteenth century. For dragging logs out of the woods, the iron spurs were driven into the opposite sides of the log and horses harnessed to the ring. The more the pull, the tighter the clench. Lewis Treffinger, above noted, says that he sometimes used four horses for heavy logs with his heavy, hooked shackle here shown (middle). The other specimen, Museum No. 20256, was made about 1885, in Clinton Co., Pa.

together in a single string or laid side by side in a double string; (*c*) the log chain or ox chain, with a ring or a large coupling hook at one end and a small chain hook at the other for dragging lengthwise or rolling sidewise a log, when noosed or wrapped around it; (*d*) the log hook spiked into the log side for the same purpose; and (*e*) the growser or brake chain for wrapping around a log to retard its down plunge, dangerous to men and oxen, on the mountain side. Look twice at these suggestive chains, so little known, so rarely seen, forged and spurred for the forests' doom. No boast, no excuse, no exaggeration in the stern story they tell of the crash of trees, the shouts of lumbermen, and the fatal song of the saw.

**Fig. 36.—Log Grabs and Log Chains**

These little observed tools except A, C, and F, were obtained in June, 1925, from Mr. A. J. Marschner, saw mill owner of Roulette, Potter County, Pa., who as a lumberman of the 1880's describes and explains them for this illustration as follows:

(*G*)—shows the "single trailer grab," a short chain spurred at each end, exactly resembling the log shackle (Fig. 35) except that the chain is swivelled, to prevent twisting, when a dozen or more logs are dragged in a string by this instrument, spurred longitudinally from the rear end of one log to the front end of the following log.

(*H*)—the "double trailer," consisting of two log shackles (Fig. 35) swivelled together on a central chain which repeats the operation on two strings of logs, set side by side, when pulled, wriggling, rolling and twisting down the mountain side. The four spurs on the four chain ends are missing on this imperfect specimen.

(*A*)—the "log chain," ten to fifteen feet long, terminates at one end either in a large ring, not here shown, through which the chain easily passes, or as here illustrated, in a large open hook, ditto. Its other end is mounted with a smaller narrow mouthed chain hook, through which a link will pass flat, but not sideways, hence the latter hook will clasp the chain on any link against the alternate turned link without penetrating the link hole. The log chain is thus easily noosed or grappled upon itself and meets many emergencies. It serves as a "binding chain," to secure logs to the wagon or sled as shown in Fig. 38. As a shorter pulling chain "ox chain" (*B*) for oxen or horses, or a makeshift "brake chain" for sleds or wagons, etc. It will also drag a log forward, if noosed around its end, or roll it sideways if properly wrapped or hooked around its middle.

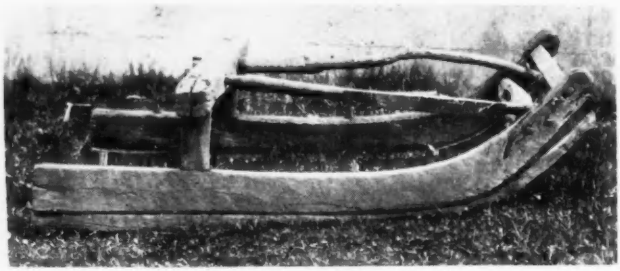


**Fig. 37.—Log Sled**

A massive home-made wooden sled, with wooden runners unshod with iron, which, when backed under the pried up log end, reduces friction in the winter transport of a log thus lifted at one end, while its other end drags on the snow. Single, modern sled sections of the so-called "bob sled,"—a long sled composed of two similarly shaped iron-shod sleds, coupled together longitudinally, are still so used (1925) at Hohlefelder's lumber yard, in New Britain, Bucks Co., Pa., where also, as in Potter Co., Pa., the whole log, supported at both ends, is sometimes transported on the complete "bob sled." Information of the lumber merchant, W. J. Hohlefelder, New Britain, and A. J. Marschner, Roulette, Potter Co., Pa. Specimen No. 9992 was obtained in Bucks County about 1900. One like it was found May, 1925, stored in Yonkin's disused saw mill near Haycock Mountain, Bucks Co., Pa.

For long distances in winter time

THE LOG SLED (Fig. 37)

a heavy, low, home-made wooden sled, minus iron runners, served the same purpose. One end of the felled and trimmed tree having been pried up on blocks or stones with crow bars, and the sled pushed under and chained fast to it, the log was pulled by horses or oxen harnessed to the runners, out of the woods and along the roads over the snow to the saw mill. In its progress its fore end was thus lifted to reduce friction and its rear end dragged. Employed since the settlement of Pennsylvania, this ancient transport apparatus fell gradually out of use after about 1885. Nevertheless, William J. Hohlefelder says that he still thus uses one of the sections of a modern double runner sled in transporting logs in winter to his saw mill in New Britain. But far more effective than the sled, for distant road transport was

THE LOG WAGON (Fig. 38)

as here shown; upon the high frame of which, logs were, and still are, loaded by dragging them sideways on "skids" over the wheel tops. According to information given to the writer by Charles Hohlefelder, Jr., April 25, 1925, the felled tree, lopped of its branches and cross-cut at both ends with the cross-cut saw, is rolled with cant hooks if possible, or if not, in

The "log hook" (*E*) if spurred into the log side, and caught by its ring to the log chain hooked to horses or oxen, will serve the same purpose.

(*F*)—is a special "log hook" of similar construction but with rigid ring, found with the log wheels (Fig. 46) and used with a similar hook to shackle logs under the axle of that apparatus as described.

The short heavy "growser chain" (*D*) noosed through its ring around a log, and with its end spur "grab" spiked fast thereto, acts as a brake to retard the down slip of the log on muddy or icy slopes (trails).

The binding chain (*A*) and boom chain (*C*) now, (1925) in use at W. G. Hohlefelder's lumber yard at New Britain, Bucks Co., Pa., were kindly loaned for the illustration by the latter.

**Fig. 38.—Log Wagon**

The logs here shown, laid upon a log wagon of century-old type, have been dragged upon its high frame on two stout, ten to twelve foot long poles, called "skids" over the wheel tops. Photographed March, 1925, as still, with six other similar wagons, in use at the wood-yard of Wm. J. Hohlefelder, at New Britain, Bucks Co., Pa. The wagon, made by a country wheelwright about 1895, is wooden axled (old style), but very high framed, forming the log rests called "bolsters" level with the wheel tops. It is equipped with a brake and is extensible on its long "coupling pole," extending from axle to axle, to fit varying log lengths.

The chaining of the logs to the wagon appears too faintly here to be understood at sight. Two "log chains," ten to fifteen feet long, with a chain hook at one end and a ring, or ring hook, at the other (*cf.* Fig. 36), first wrapped around the coupling pole, are passed loosely and caught with their chain hooks over the logs at either end thereof. Under these chains, so wrapped, two hickory saplings called "booms" are thrust at right angles to the logs, from the log-end or outside of each chain wrap, and then toggled or twisted inwards over the middle of the log to tighten said chain wrap. To hold fast these "booms," thus twisted, the light three to four feet long boom chains (*cf.* Fig. 36) are noosed over the boom ends, by slipping the boom chain hooks through the boom chain rings, drawn tight, and hooked around the coupling pole.

A log placed on the ground parallel to the wagon, is loaded as follows: Two stout, ten to twelve foot poles, called "skids," hewn flat at the top, are laid, at right angles to the wagon, from the wheel tops to the ground against the log side. A log chain is then hooked to a ring on the inner face of one of the bolsters, wrapped through the wheel top over the skid, again back through the wheel and down under and over the log. This log chain is then fastened by its chain hook to another log chain, similarly placed, extending from the other bolster, via the other wheel top, etc., and under and around the log as before, so as to form a loop, to the middle of which the horses standing on the opposite side of the wagon are attached by a third log chain. As they pull, the log rolls up the skids, over the wheel top, and on to the bolsters.

The writer saw two cedar "skids," laid from axle to axle, on one of these log wagons, as it brought a heavy log to Overholt's Deep Run saw mill in Bedminster, Bucks Co., Pa., in May, 1925. The log was unloaded by one man, who rolled it easily with a cant hook over the wheel top, without the slightest injury to the wheels.

"tight places," chain-dragged with horses directly, or with tackle guyed to trees, to the side of, and parallel with, the wagon. Two heavy ten to twelve foot fresh-cut poles ("skids") are then chained from each wheel-top, (*i.e.* the chains wrapped through the spokes and over the "skid") so that the pole ends reach the ground close to the log. Whereupon, when two wide-spaced chains are looped under, and hooked over the log, the horses standing on the opposite side of the wagon, are harnessed to the middle of the loop and pull the log up the skids, over the wheel-tops and on to the wagon. Other

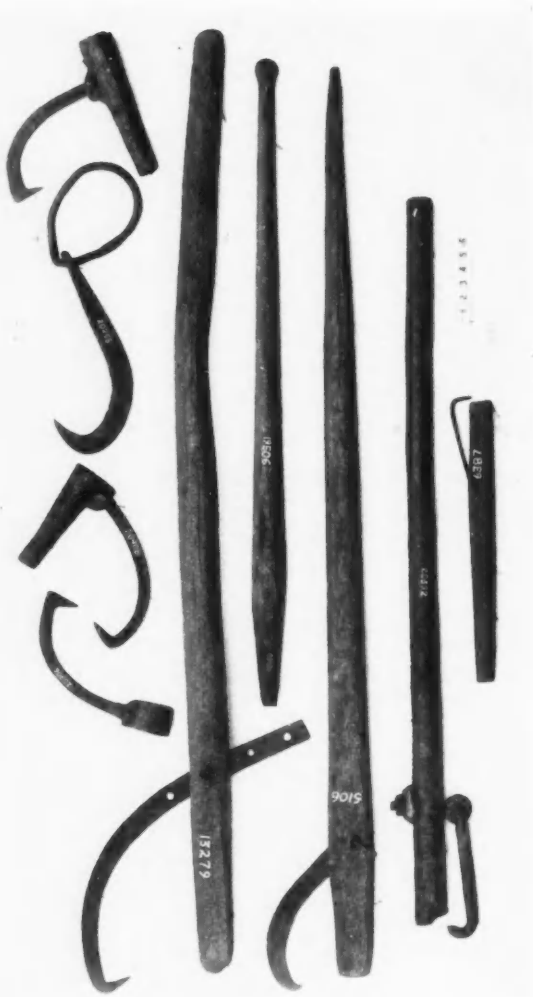



**Fig. 39.—The Cant Hook**

The German "Kanthaken" and French "Renard." This particular pattern, Nos. 13279 and 9019 (centre), probably originated in Germany. The spur, either extensible or non-extensible, works loosely on a pin through a handle-slot, grasping or releasing a log by the pull or back push of the handle. The instrument works both ways. It rolls a log away from the workman on a handle push, if the spur points towards him. If the spur points away from him, the log rolls towards him on the pull. Sometimes, though rarely, according to John Overholt, mill sawyer of Bedminster, Bucks Co., Pa., the workman must stoop to release the hook with his left hand.

chains are then wrapped around the loaded log under the wagon framework and these are tightened by saplings, (toggle sticks) called "booms," thrust under said chains, more or less twisted and chained to the wagon frame. During this operation the vertical axle posts are moved from their sockets and replaced, after which the horses are reharnessed to the pole, and the wagon loaded with one, two, or more logs, begins its slow journey to the saw mill.

For rolling rather than dragging logs, the next two illustrations show a far more ingenious one-man master tool,

### The Cant Hook (Fig. 39)

called "Kanthacken," in Myer's *Konversations Lexikon*, and "Renard," in Diderot's unrivalled *Encyclopedia*, of 1768. The wooden staves shown are mounted with spurred iron hooks (one of them, No. 13279, adjustable through four holes) loosely hinged on iron pins through mortise holes, and forming jaws, which, opening around the log, grasp it with the spur, and roll it by a back pull of the staff. As we see, the grasp of this hook can be enlarged, but the non-adjustable, No. 5106, cannot be used on logs too big for its spur.

Both specimens show the common type used on farms and at country and riverside saw mills in the Delaware Valley in the 19th century.

The writer has failed as yet to find evidence for the origin or antiquity of this remarkable tool, which Mr. Herman Muller, of Trenton, says he saw thus constructed and in use about 1863 at the "Hirschmuhle" saw mill at Rodach, near Coburg, Germany. It does not appear in the Essex County probate records, 1635-81. Moxon does not mention it in 1678. The *New English Dictionary* does not quote any use of the word "cant hook" in the English language earlier than 1848, but Diderot who calls it "Renard" (fox) describes without illustrating it in 1768, and the sentence, "Jemand beim Kanthaken nehmen," (to take him with a Kant-hook) quoted as used in 1695 in Germany, in Kluge's *Etymological Dictionary of the German Language* (information R. P. Hommel) proves that the tool was in use in Germany two hundred years ago. Kluge describes it

Without considering factory-made or patented cant hooks, other home-made types of the instrument, with hook greatly varying in curve and with square or round point, appear in eastern Pennsylvania, as the ring dog cant hook (Fig. 40), now generally obsolete, and in the Pennsylvania lumber region, a third form, not shown, in which the spur is hinged on a wide clasp (as in the "peavey," Fig. 42), which clasp, meeting in a bolt upon which the claw is hinged, is riveted upon the handle.

In the home-made cant hooks now (May, 1925) used at John Overholt's saw mill, above noted, the non-adjustable spur hinges, not on a clasp, but on a bolt penetrating the handle; while some of the farmers bringing logs to the mill, still use the ring dog form (Fig. 40) also here shown, second downward, left side.

According to the information of Arthur J. Marschner, lumberman of Roulette, Potter Co., Pa., and Mr. J. C. French, to the writer, a fourth variety with a short iron beak, not here shown, set at right angles to the base of the handle, was used in the 1880's in the Pennsylvania mountains, where and when any cant hook, minus a pike point, was called a "muley cant hook." Col. W. H. Shoemaker, on the authority of W. J. Phillips, of McElhattan, Pa., informs the writer that the handles of the old cant hooks in the lumber period *c.* 1850 to 1890, were made of ash.

The non-adjustable specimen, No. 5106, was loaned by Christian Myers, 1916, and was used at Stover's grist and saw mill on Tohickon Creek, Bucks Co., Pa., in the late nineteenth century, and the adjustable No. 13279 was given July, 1918, by E. S. Lovett, of Taylorsville, Bucks County. In the unhandled No. 20408 and its fellow (upper left) from Clinton County, the hook hinges on a rivet in a wrought iron pointless socket.

No. 20392, from Colonel Shoemaker, made by Seth Nelson in Clinton Co., Pa. (right), shows the blacksmith's similar instrument for squeezing hot iron wagon tires upon the wooden wheel rims.

No. 6387 is a cooper's tool, from New Bedford, Mass., working on the same principle.

**Fig. 40.—The Ring Dog or Ring Dog Cant Hook**

Another pattern of the highly effective and indispensable cant hook is here shown in its old Anglo-American and also German form, namely, a curved, iron arm with a spur at one end, and a ring into which a handle is pushed at the other.

No. 20255 was obtained, 1925, by Col. H. W. Shoemaker from Seth Nelson, Sr., of Round Island, Clinton Co., Pa., whose father made it about 1840. The other specimen, probably of about the same date, was found May, 1925, at Younkin's abandoned saw mill on Haycock Run, Bucks Co., Pa.

John Overholt, mill sawyer and owner, of Bedminster Township, Bucks Co., Pa., tells the writer that some farmers bringing logs to his mill, still (1925) use the ring dog, one great advantage of which he says is the unattached handle easily replaceable if broken, by a sapling cut in the woods. Hence these tools can be carried about minus handles on log wagons. The ring should fit reasonably on the handle and not slip too easily. If too loose, a twig or splint wedge will tighten it.

as used at seaports for the tilting and turning over of barrels and boxes. Hence, the twenty patents under the word "cant hook," in the United States Patent Records (first 1856, to Allicott, of Hancock, N. H., and last, in 1873, one in New Hampshire, and one in Maine) are not inventions of its principle, but only attempts to adjust or strengthen its powerful grasp.

The next illustration shows the instrument in simpler if not older form, as used previously in the forests of eastern Pennsylvania, namely the

RING DOG (Fig. 40)

in which the hook is not pivoted through the staff, but equipped with a loose ring, through which the staff is thrust. While in Figure 39 the spur is lengthened by shifting the spur-pin, so as to grasp a larger log; here the grasp of the instrument is less efficiently increased by a deeper thrust of the handle into the ring.

David Angeny, carpenter, of Danboro, Pa., tells the writer March, 1925, that he saw logs rolled in Bucks County, in the late 19th century, without cant hooks, by the extra leverage of crow bars thrust through chains wrapped around them.

In the right specimen shown, No. 20255, the ring is twisted to the

proper angle for handle insertion. It was made by Seth Nelson, Sr., about 1840, near McElhattan, Pa., and represents, as noted, the older type of cant hook frequently used in Clinton and Berks Counties, Pa. in the 19th century to roll logs.

Meyer's *Konversations Lexikon*, Edition 1894, *cf.* "Kanthaken," omitting all reference to the type shown in Figure 39, also German, describes this ringed spur only, as if no other form of cant hook existed in Germany; and Mr. George Sturt, of Farnham, Surry, England, in more than thirty years' experience in England as a wagon manufacturer, tells the writer in April, 1925, that he has never seen the form shown in Figure 39, and that this ringed form, called in England, "ring dog," is the only English cant hook known to him.

Besides the above ancient tools and apparatus adapted to the shift of the raw material (logs) by summer and winter on land, several others, as part of the equipment, rather of later organized bands of lumbermen, than of the individual farmer or pioneer, relate to log and lumber transport by water, namely,

### The Jamb Pike (Fig. 41)

an important special tool of the lumberman used in deforesting the mountains of Pennsylvania, in the 19th century, as here shown, a stout pole, ferruled upon a home-made iron point, used by the lumberman in the dangerous operation of prying free single logs, wedged or caught fast, or heavy masses of floating logs, "jambed" fast, in their water transport down the freshet-swollen mountain streams. With its restored handle it was kindly obtained for this illustration May,

**Fig. 41.—The Jamb Pike**

An iron spike, here also shown loose in duplicate, is inserted and fixed with iron bands (ferrules) into the end of a stout pole, by which, worked with one or two

**Fig. 42.—The Peavey**

Here, a cant hook has been attached to the pike end of a jamb pike (Fig. 41), forming an effective combination of two lumbermen's tools in one. It releases jammed or caught logs, not only by prying up but by rolling them. According to Mr. J. C. French, of Roulette, to the writer, May, 1925, it was devised by John Peavey, a blacksmith at Bolivar, Allegheny Co., N. Y., about 1872; and according to A. J. Marschner, mill sawyer, of Roulette, Potter Co., Pa., is still in use in slightly modernized form in Potter County.

The rare and very interesting specimen shown at the left, of date soon after its invention in the 1870's, shows the original make of the tool, as a combination of the jamb pike (Fig. 41) and of the so-called "muley," or old, variously made, but unspiked cant hook (Fig. 39). The hook is held by a clasp. The stock, somewhat thinner than the usual 2¾ inches at thickest peavey stock, is of iron wood (*Carpinus Caroliniana*). It was obtained May, 1925, from Mr. Marschner, who found it at his saw mill in Roulette, among the old tools used forty years ago and earlier, by himself and his father. Mr. Marschner says: "The peavey I sent you (left) is a real old one, and does not conform to the latest style now in use at our mill, chiefly because the clasp is old style, while our modern clasps are solid with projections beneath, which hold the hook a little away from the pike and above the clasp, and a bolt to stop the hook from coming close to the handle, and possibly pinching the 'lumber jack's' fingers (*i. e.*, in releasing the hook by a hand pull.—H. C. M.)."

The peavey (right) of somewhat later make, is another of Mr. Marschner's mill relics, in which the spike enlarges into a socket, into which the handle is inserted and riveted, hence when the handle breaks it is more easily repaired than the older peavey which, in that case, had to be respiked and re-ringed by a blacksmith. When bought, about 1890, by Mr. Marschner, it was originally mounted with a five and a half foot maple handle, which was broken and replaced by the present ash handle, also broken close to the pike and re-inserted, as noted, in the socket.

Mr. French describes the best make of the peavey, in the height of the lumbering period, *c.* 1880, to the writer, May, 1925, as follows:

men, the lumberman shifts the position of heavy logs, or pries loose single, floating logs, caught fast, or floating masses of logs, jammed, in their downward passage to rivers, or saw mills, on freshet-swollen mountain streams. Made before 1870, it was used by the father and grandfather of Arthur J. Marschner, lumberman, of Roulette, Potter Co., Pa.; also by the latter, from whom it was bought May 20, 1925, and who says that it went out of use in Potter County in the 1880's when it was supplanted by the peavey (Fig. 42). The handle has been restored by Mr. Marschner and lacks one, if not two, of the original iron ferrules over the pike point.

Mr. Marschner writes May 28, 1925: "I only have a dim recollection of the jamb pike, and remember that it was large and heavy and that it was further used for prying and lifting, punching holes into the ground; also for pulling grabs (*i. e.*, prying up tight-driven shackle points). Mr. French states that (before the invention of the peavey—H. C. M.) two men, one with a cant hook and the other with a jamb pike, worked together on roll ways (not described) or floating logs, as above noted.

1925, by Mr. John C. French, of Roulette, Clinton County, Pa.

But the day of the jamb pike has passed with that of the primeval forest and the adventurous lumberman so that now, 1925, in the bared mountains of Pennsylvania, the tool has become no less a rarity than the celebrated

PEAVEY (Fig. 42)

a still more efficient modern combination lumberman's tool for the same purpose, by which a cant hook attached to a jamb pike above the pike point enables the daring "lumber jack" to roll towards him, as well as pry away from him, the key log, and so release with a crash the conjested log mass upon the dammed-up roaring waters.

When, about 1870, at Bolivar, N.Y., according to the information of Mr. John C. French, the blacksmith John Peavey thus added to the efficiency of the jamb pike by attaching a cant hook to it, he never sought to patent his apparatus, and his name does not appear among the grantees in any of the twenty United States patents for cant hooks between 1856 and 1873, nor

**Fig. 43.—The Raft Auger**

With this instrument held vertically in his left hand, while turning the crank with his right, the raftsman bores holes, two by two, into the tops of the ends of logs, floating side by side, so as to yoke them together into rafts, by means of wooden staples, pegged over cross-laid saplings, as explained in the text. Mr. J. C. French, of Roulette, Potter Co., Pa., informs the writer, May, 1925, that the raftsman found it easier to stand erect on the log when boring these holes,—hence he preferred this long instrument to the common

"The maple stock is white, short-grained and flawless. The hook of best cast steel, with the proper curve and point,—the pick of tool steel. The clasp and bands of the toughest Swedish or Norway iron. Many imitations of the peavey lever and hook have been made since 1872,—useful tools,—but not equal to the original."

When used to pry logs up, sidewise, or endwise, the peavey had to be turned on its side, or under, to get the hook out of the way. Mr. French dramatically describes its dangerous use in holding back (on the back pull) logs rolling down hill; and Mr. Marschner, its further efficiency in prying up grabs (shackle hooks) (Fig. 35), trailer and growser chains (Fig. 36), and log hooks (Fig. 36), etc.; also in pushing, with the pike point only, or pulling, with pike and spur together, floating logs, for which latter purpose, and general "log running" in freshets, a special light, slim, long-handled, so-called "driving-peavey" was used.

**Fig 44.—The Raft Shackle**

In this instrument, the two straight spikes driven into two floating logs or two dislocated parts of log rafts on the Delaware River, chained them together, until the abandonment of log rafting, *c.* 1890. Information of Dr. Cooper of Point Pleasant, September, 1924, and John Young, ditto, May, 1925. This specimen, No. 472, was given by Frank Preston, of Carversville, on the Delaware, in 1897. The spike-points are not round but wedge-shaped (*cf.* Fig. 45).

under the reference to the word "cant hook," ahead of patents in *Harper's Magazine* in 1848. But he immortalized his name, and added a word to the language, for his new fore and back action tool, as illustrated in *Webster's Dictionary*, Supplement (Edition 1906), was named "Peavey," and becoming at first popular in Northern Pennsylvania, soon grew famous as part of the equipment of lumbermen throughout the United States. In its early home in Clinton County, Penna., the short-lived master tool went out of common use when the forests failed and lumbering ceased, about 1900.

It is only after the loose logs have finished their wild and obstructed dash down the mountain stream, and reached the river, that

### The Raft Auger (Fig. 43)

explains their assembling and construction into the tremendous rafts that, after 1840, helped by canals and railroads, carried them at high water to their destination at river-side saw mills or distant cities.

This eccentric, home-made spiral auger, with long iron shank, hand-crank elbow, and lacking the wooden cross-handle, was obtained March 3, 1925, by Col. H. W. Shoemaker from Seth Nelson, born about 1838, lumberman, mountaineer, hunter, trapper, maker of axes, lumber tools, hunting knives, bear traps, and general artificer, who had forged it for the raftsmen in his younger days, at Round Island, Clinton Co., Pa.

At that time rafting was in full swing, and the great floating islands went down the Susquehanna and Delaware in season, often dozens per day. The prehistoric mantle of Pocono

short, cross-handled auger, which would have required him to stoop.

Mr. David Baird, president of the David Baird Lumber Co., of Camden, N. J., remembering the rafting days, writes June 2, 1925, that the tool called "crank auger," is not now obsolete, but still employed by wharf builders, ship builders, and contractors; that it enabled the raftsman to stand erect at his work, and that it is a very rapid instrument for boring holes in pine and hemlock lumber.

Mountain was going or gone when John Young was employed in sawing raft logs at Stover's Mill, Point Pleasant, Bucks County, Pa., who informs the writer May, 1925, that the Delaware rafts floated down from the mountains in his time, were constructed as follows: across either end of a group of logs floated side by side, a thin two to four inch pole generally of ironwood (according to T. S. Kinderdine, see illustration) was laid and fastened by steamed and bent ash splints stapled across them, one staple per log. These staples called "bows," were pegged into auger holes, two holes per log, bored on either side of the pole with the raft auger as here shown.

Because, adds Mr. J. C. French of Roulette, Potter Co., Penna. the raftsman balanced on a single log, found it easier to stand, rather than stoop, at his work, he preferred this high-action instrument, held at its top with his left and cranked with his right hand, to the common short, cross-handled auger, which Mr. Young says he never saw used on a raft.

As also connected with the rafting of logs, and an epoch of adventure which still haunts the memory of old men, the next two illustrations show

The Raft Shackle (Fig. 44)

a short chain, ringed at either end upon straight spikes, which if driven into the tops of adjacent floating logs, or disrupted raft sections, will shackle them together, and

The Snubb Ring (Fig. 45)

a ring-mounted, wedge-shaped, iron spike, which, when driven with the grain into the end of a lost log, and roped through the ring to a boat, will salvage the log, otherwise it will moor a raft to the shore, or fasten it to other rafts or logs, or draw a log to the "wheels."

**Fig. 45.—The Snubb Ring**

A ring-mounted, wedge-shaped iron spike, which, when driven into the top of a floating log at its end and roped through the ring, will moor the log to the shore, or fasten it to a raft or other logs, or draw it to the log wheels. According to the information of Mr. J. C. French, to the writer, May, 1925, "The log was caught by driving the wedge into one end, passing the rope through the ring, then with another log, and another so caught, towed like 'a string of suckers' to an eddy or a cover and tied to a tree or a stump, until the owner called with a tug boat, paid one dollar per log to the 'scavengers' and took the salvaged logs to a saw mill beyond to be sawed into lumber."

Besides this use, on the Susquehanna and its branches, Mr. French says, that, "Mr. Benjamin Burt, of Potter Co., Pa., now (1925) aged eighty, and his father, Benjamin Burt, Sr., born 1811, on Lake George, N. Y., used these ringed wedges to drag logs out of the woods. In that case, the wedges were chained together as with the drag shackle (Fig. 35), one being driven into each side of the log end, and horses attached by a chain and hooked to the middle of the wedge chain."

Charles Robbins of Potter County, aged seventy-five, says that his father dragged logs with a single one of these instruments, barbed on its sides and corners, driven not into the side or top, but into the sawed face of the log end.

The wedge point was preferred to the spike point, for this instrument, because easily driven in with the grain, it was easily pulled out, without risk of leaving a broken iron point in the wood to rupture a mill saw.

**Fig. 46.—The Log Wheels**

For pulling raft logs out of the river. The two gigantic wheels were rolled if possible into the water on a hard shallow beach over a floating log. Then horses, attached to the very long tongue, dragged the log, shackled with two log hooks (Fig. 36), and chained to the under-axle hooks of the hand screw, here plainly seen, out of the water and up the bank to the neighboring saw mill.

According to the information of John Young, mill sawyer, *c.* 1870–90, of Point Pleasant, to the writer in May, 1925, the more mid-balance the log got, the easier its rear end dragged, hence the length (22 feet 6 inches, from axle) of the tongue of these wheels, to get the horses out of the way of their burden.

Similar wheels were seen in use by Patrick Trainor of Philadelphia, in *c.* 1867, hauling logs out of the pine woods in Ocean County, New Jersey, and in *c.* 1861, drawn by about twenty white horses, hauling a stone for Col. Ellsworth's grave in Brooklyn, N. Y. (Information of P. T. to the writer June, 1925.)

The wheels and one of these log hooks were presented in April, 1925, by Mrs. Elizabeth B. Troemner, owner of the now obsolete saw mill, at Point Pleasant, Bucks Co., Pa., where they had been kept in a shed since the disuse of the mill about 1890.

The log hooks, save for their rings, too small for a handle, resemble the ring dog (Fig. 40) minus its staff. Through these rings, when the spurs were driven in the opposite sides of the log-end, a loose chain was thrust and hooked to the under-axle hooks seen in the picture.

This last far more conspicuous and now forgotten apparatus, connected with the water transport of the carpenter's raw material, appears in the next illustration as the

### Log Wheels (Fig. 46)

for hauling raft-logs out of the water to river-side saw mills. A gigantic cart, disused on the Delaware River in the nineties, when forests failed and rafting stopped, it was wheeled where possible, into the river, on a hard, shallow beach, near the moored log raft. Whereupon, a detached log, clutched at its end by two loose, ring-topped hooks (see Fig. 36) was chained through the rings of the latter, to the lower forks of the heavy iron turn-screw penetrating the axle. Otherwise, a common chain wrapped around the log would serve the purpose. The turn-screw was then cranked up to lift the log end, and horses pulled the wheels and suspended log, with its dragging rear end, out of

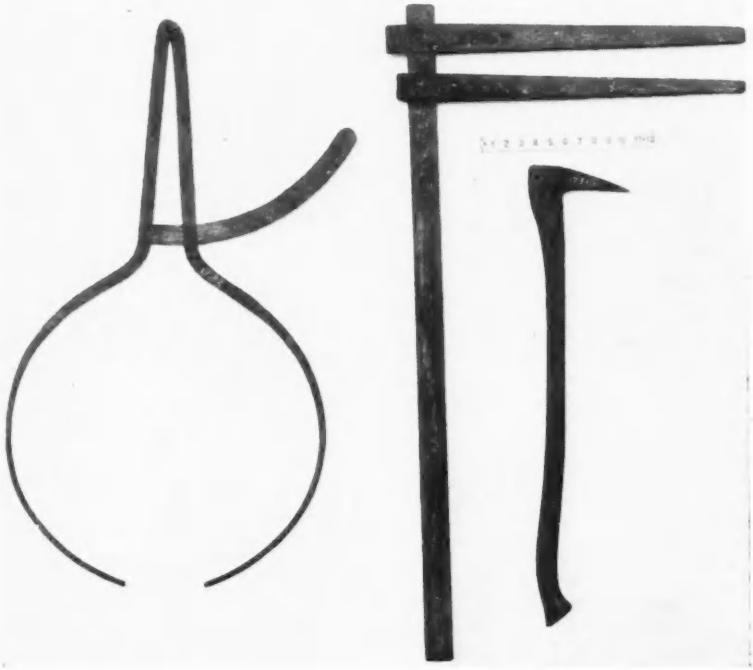


**Fig 47.—Log Measures**

The illustration shows the lumberman's calipers (left) from Vermont, and sliding scale (right) from Pennsylvania, for finding the diameter of trees or logs. Another home-made specimen, generally resembling the latter, was found by the writer June 2, 1925, among the discarded tools at the disused water-run, frame-saw mill of the late Christian Myers on Tohickon Creek, Bedminster Township, Bucks Co., Pa.

the water and up the bank to the saw mill. Where the bank formation prevented, the wheels remained on shore and the loosened logs were dragged to them out of the river by ropes tied to the "snubb rings" (Figure 45) or common chains, wrapped or tightened on slip rings around the log ends.

Who remembers these details today, except John Young, above quoted, who in the 1880's used the historic apparatus presented to the Bucks County Museum in April, 1925, by Mrs. Elizabeth B. Troemner, owner of the long closed, riverside saw mill, at Point Pleasant, Bucks County, Pa., where it had been stored in a shed since the saw stopped working about 1890.

This brings us to another group of tools concerning the sale rather than the transport of the raw material, and pertaining to the lumberman owner or lumber merchant, who used them in the measuring, buying, and selling of

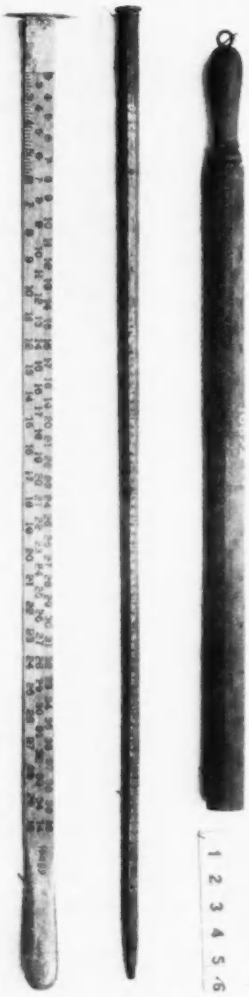


**Fig. 48.—The Lumber Stick**

The lumber merchant's log measure, a polygonal, scaled staff of wood, used to measure the diameter and length, and hence to calculate from its scale, the cubic contents of logs, employed in Pennsylvania until c. 1840. As now in use in its modern form, the left specimen was bought by the writer in 1925, at a lumber supply store in Philadelphia.

standing trees, logs, rafts, balks, boards, sawed lumber, etc., namely

THE LOG MEASURES (Fig. 47)

here shown as an iron calliper, No. 17182, from Vermont (left), opening upon the log, which measures its thickness on the scaled arm; and the old scaled stick with its sliding arm adjustable against the diameter of the log, from Bucks County, which serves the same purpose. The next illustration

THE LUMBER STICK (Fig. 48)

shows (right) two polygonal sticks, long out of use, for ascertaining the cubic contents of logs or lumber, by calculation, according to known rules, from the varying scales marked on each of their facets. No. 19489 (left) is a flat stick, still used by lumber dealers in Eastern Pennsylvania, for the same purpose, or for measuring the cubic contents of piles of boards or squared lumber. It was bought August, 1924, from T. C. Ulmer Co., Lumber Supply Store, Philadelphia, Pa.

Next is shown

THE RACE KNIFE (Fig 49)

the lumberman's little two- or three-pronged timber scribe or scorer used to register tallies, numerals, crosses, circles, etc., on log ends, balks or boards for selling them, or otherwise to mark the parts of worked-up material in assembling it into framework.

The fixed iron point of this tool will form the centre of a circle inscribed with its hinged, scoop point, while the fixed scoop, also used singly, cuts hollow channels. The race knife was used

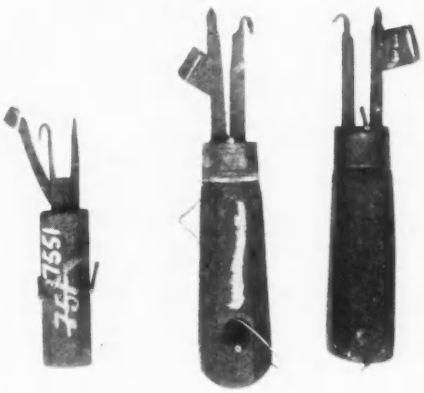



**Fig. 49.—The Race Knife**

The vertical iron prong of this tool will form the centre of a circle inscribed with its fixed scoop-knife. Another scoop-knife, fixed to the side of the prong of the right and middle specimens, if held singly with the tool handle pressed against the wood, cuts straight hollowed channels. In the lefthand specimen this extra scoop-knife is on a hinge. Used by coopers to mark barrels or barrel parts; by lumbermen to tally or number with Roman numerals balks or log ends; and by carpenters to register junctions for heavy frame work, in the latter case accounting for the numerous Vs Xs and multiplied I's seen at the mortised beam and rafterfittings of old barns and sheds.

T. S. Kenderdine, in "Lumbering Days on the Delaware," *Bucks County Historical Society Proceedings*, Vol. IV, p. 247, says concerning the marking of sawed lumber with this instrument: "When formed into rafts, chalk or lead pencils would not do for noting dimensions, as the water would wash the marks out, so the knife-edged hook was used, which gouged them out in Roman characters, some of them modified; thus, a perpendicular under the cross of an X made a 9, and under that of the last of a double X a 19. An upstroke from the cross of an X made 15; from the last cross of a double X—25, a down stroke under an upset V—4, etc.

"These were the days of large pine logs, when boards and planks came from the mills two feet and more wide, which at first were set aside at the yards for coffin-case boards."

The specimens illustrated here have been used by coopers. No. 7551 was bought at York Harbor, Me., in 1898. The others are from New Bedford, Mass.

by coopers to mark barrels or barrel parts, or by lumbermen to scribe or number balk or log ends, or by carpenters to register junctions for heavy framework.

A simpler form of this tool (see "Race Knife," *Knight*) consists of a single, steel scoop-point fixed in a wooden handle. At best it works slowly compared with the more restricted but instantaneous

### Marking Axe (Fig. 50)

an axe-shaped block of iron or steel still used for stamping the owner's initials, etc., on logs or lumber. When struck by its wooden handle against the sawed log or balk end, the initial *J* for the owner's name, and the number *2*, here seen worked in relief on its pole, are stamped against the wood.

Both specimens were obtained in 1924, by Col. H. W. Shoemaker, from Seth Nelson, of Round Island, Clinton County, Pa., born 1848, who made them about 1900.

Thus far the tools described, many of them rarely seen and generally overlooked in books, pertain to the felling, transport, and preliminary shaping of

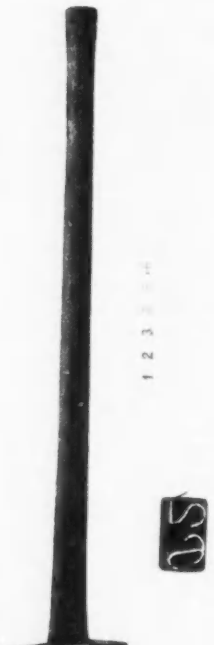



**Fig. 30.—The Marking Axe**

This heavy block of iron, mounted like an axe on a wooden handle and faced with the initial "T" and number 2 in high relief, was used to stamp the owner's initial and number, on the end of a log at a single blow. By means of these marks, according to Dr. B. F. Fackenthal, Jr., of Riegelsville, on the Delaware, Bucks Co., Pa., log waifs, lost or disrupted from wrecked rafts, were identified and salvaged by boatmen along the river shores (*cf.* snubb rings, Fig. 45). Obtained by Col. H. W. Shoemaker, in Clinton Co., Pa., where the tool is still (1925) in use.

the raw material. Now, at last, the tree, whether still unshaped, or transformed into boards or balks, has reached the carpenter, and his work upon it begins with

THE CROW (Fig. 51)

which unlike the special straight, round-pointed, saw-mill crow bar, shown in Figure 30, is an iron bar whose leverage is increased by a very characteristic claw, used either to pry up heavy timber, or pull spikes. This master tool, the Roman "Vectis," the German "Waltze," or "Hebel," was probably not called "Crow Bar," in England before the 19th century, *cf. New English Dictionary* quotation 1400-1458-1590 for Shakespeare, etc. and Reese's *Encyclopedia*. In the picture we see it as illustrated and described by Moxon in 1678, Croker's *Dictionary of Arts and Sciences*, in 1764, and *The Circle of Mechanical Arts*, in 1813. It consists of (*a*) the shank, (*b*) the very noticeable flat curved lower notched end, the claw, and (*c*) the round-pointed upper end, the "pike end." The bent claw clearly distinguishing it from the common crow bar and saw mill crow bar, illustrated in Figure 30, puts it at the head of its class. Up comes the beam or out the spike when this mighty prong is pried under it, often on an underplaced block or fulcrum. In the upper comparatively modern specimen of date about 1880, the claw is reinforced with a ring clutch.

THE DRUG (Fig. 52)

is a home-made carpenter's truck on wooden cylindrical rollers, used for shifting heavy pieces of timber pried up upon one or more of these easily under-placed wagons, as here shown and as illustrated by Moxon in 1678.

But the "Drug," dependent upon the "crow," dwindles into insigni-

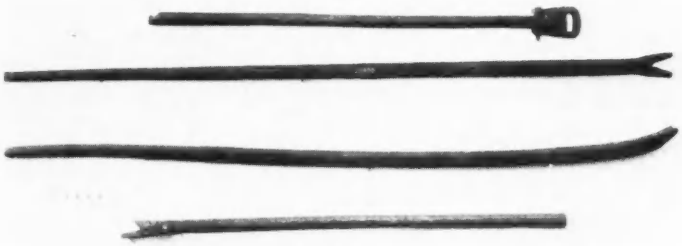


**Fig. 51.—The Crow**

The typical carpenter's crow bar, distinguished from the other forms of the instrument by its bent claw, is here shown as described and illustrated by Moxon in 1678. In the top and bottom (front and side view) of the comparatively modern specimen, of date about 1880, the claw is equipped with a ring clutch. The middle specimen, also here duplicated in side view (No. 20400), was obtained March 3, 1925, from Col. H. W. Shoemaker. It was made by Seth Nelson, Sr., near McElhattan, Pa., about 1870, and reforged by his son about 1885. The ringed crow was obtained April 17, 1925, from David Angeny, of Danboro, Pa.

ficance when compared with the all-powerful

JACK (Fig. 53)

the French "crick," a compact, boxed, cogged crank, with a top fork, to push up ponderous weights. The crank, axled on a small cog wheel, engages a larger cog wheel which, with tremendous power, elevates a vertical iron bar (rack). This raises the weight resting on its upper fork or sometimes suspended on an extra side projection.

Fortunately Moxon, in 1678, and Diderot, in 1768, illustrate this herculean tool in its old form, here shown as surviving in the United States until about 1840, by no means confined to the carpenter, but a general mechanics' tool and common as a weight-lifting apparatus on farms, when, for instance, heavy or loaded wagons, like the 'Conestoga," had to be "jacked up" to grease their axles.

The specimens are all old 19th century farm relics, obtained between 1897 and 1922, from Bucks, Berks and Montgomery Counties, Pa.

Having thus reached the carpenter's workshop we pass from the tools and apparatus used by him for moving, to those employed in marking, measuring and correctly placing his material. Look next at

THE CHALK LINE (Fig. 54)

a chalked string, previously referred to (Figs. 21 and 24) as stretched along and twanged against a log, to straight-line it for the saw or axe, therefore a preliminary lumberman's tool, but also a carpenter's implement, used to mark out long saw kerfs on planks, boards and balks.

As here shown, the string is wound on a home-made rectangular frame-spool turning on a pivot. When stretched along a log top for pit sawing, or board or balk, for ripping, or frame for cross cutting, whitened by pulling against it a lump of chalk, and twanged, it white marks the necessary guide line for the cut. Black ink (judging from Figure 32) instead of dry chalk, must have been used in the 16th century in Germany for this purpose as, according

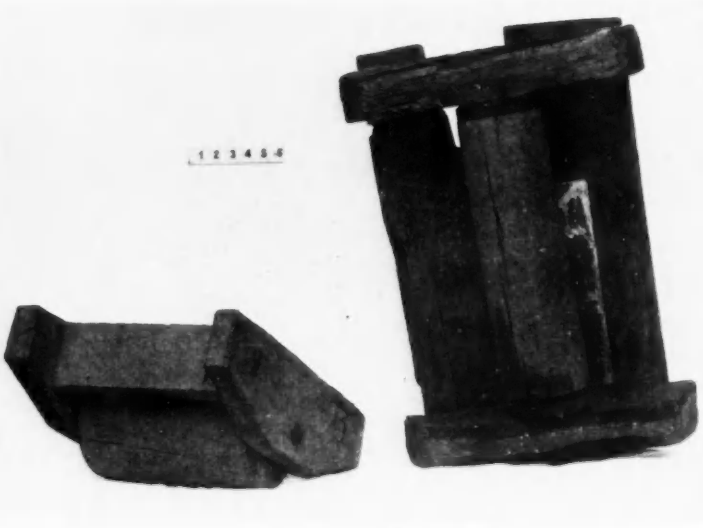


**Fig. 52.—The Drug**

A home-made carpenter's truck on wooden cylindrical rollers, used for shifting timber. Both specimens are old Bucks County relics. No. 5276 (left) was bought July, 1916, among a shed-full of old carpenter's tools, from Miss A. H. Swartz, of Point Pleasant, Pa.

to the information of Mr. R. P. Hommel, to the writer in 1924, it is now used at Chang Sei, China. No. 4171 was found in Atlantic City, N. J., No. 5096 in Philadelphia. The other specimens are old Bucks County relics, except No. 19244, which was obtained October 4, 1923, by the Rev. Clarence Hoffman, at Kang Kei, Korea. Here, as in China, fluid black ink contained in the hollow, right side of the apparatus, serves for chalk. The string fastened to the loose pegs shown, is wound through the ink on the spool (left,) and twanged wet and black, upon the "stuff."

Another carpenter's instrument in continual use and of the highest importance, is the

### Plumb Line (Fig. 55)

to establish vertical lines. When unwound from its ball and suspended from a fixed point, the string ending in a leaden plummet ("plum bob") fixes a true vertical line for the accurate erection of framework, joists, corner overhangs, etc., as described by Moxon in 1678. This applies to vertical construction only, not to the correct horizontal lines, continually needed by the carpenter. For two thousand years these have been established by means of

### The Square (Fig. 56)

the Roman "Norma," with which straight lines can be scratched or pencilled at right angles to each other or to a fixed margin, provided this

**Fig 53.—The Jack**

This compact apparatus, boxed in two slabs of hollowed plank, and exactly resembling that illustrated by Moxon in 1678, consists of a crank with a back-stop ratchet, axled on a small, forged cog wheel, engaging a larger, forged, wheel-on-wheel cog wheel, which with overpowering force lifts a vertical, forged, toothed iron bar. The boxes formed by two oaken plank sections, hollowed into troughs, are held together by three rectangular iron sleeves, slipped over and bolted upon them, and also top-faced on both sides with iron plates bolted upon the wheel work.

None of these remarkable old farm relics, obtained between 1897 and 1922, from Bucks, Berks and Montgomery Counties, Pa., are factory made. All their cranks, racks, single and double cog wheels have been hammered out with variations and decorative touches by country blacksmiths. All the specimens show chisel-cut dates on the rack face just below the fork as follows, from left to right: (1) 1807, (2) 1809, with the initials F N, (3) 1790, H. Z., (4) 1800, (5) 1793.

Not only as a carpenter's but as a general mechanic's tool, this ancient, home-made jack survived until the late nineteenth century, on farms, for miscellaneous weight lifting.

ancient instrument is properly placed upon or against the carpenter's work. It here appears in two forms (*a*) in which one arm much thicker than the other forms a shoulder or fence, intended to be set against the straight side of the "stuff," while the thin arm projects at an angle of 90 degrees across its surface; and (*b*) in which both arms are of equal thickness and the whole instrument may lie flat on the work. We also see that the arms are generally scaled to inches in class (*b*) but not so scaled in class (*a*), and further, that while the instruments of class (*b*) are all either of iron or wood, some of those in class (*a*) show a thin iron arm projecting from a thick arm of wood.

This omnipresent and highly important tool is described by *Vitruvius*, 7.3, and *Pliny*, 36.51, and frequently also mentioned in the *Essex County Probate Records*, 1635-1681. As pictured

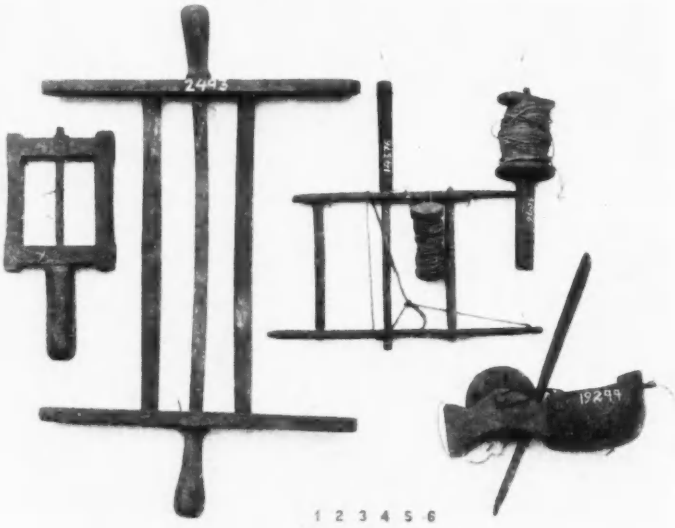



**Fig. 34.—The Chalk Line**

The carpenters' chalk lines as here shown, in the four upper specimens, are wound on home-made spools When stretched along a log top for pit sawing, or board or balk for ripping, or frame for cross cutting, and whitened by pulling against them a lump of chalk, and twanged, they white-mark the necessary guide line for the cut. The specimens are all old Pennsylvania relics, except No. 19244, which was obtained October 4, 1923, by the Rev. Clarence Hoffman, at Kang Kei, Korea. Here fluid or pith-soaked black ink contained in the hollow, right side of the apparatus, serves for chalk. The string, fastened to its loose peg (shown) is wound through the ink upon the wheel-spool (left), and twanged wet and black (as in China) upon the "stuff."

and explained by Moxon in 1678, the ancient carpenter's square, like some of the old Bucks County specimens here shown, and also like No. 19254, bought by the Rev. Clarence Hoffman at Kang Kei, Korea, in 1923, was thus generally home-made of wood before 1800. Moxon says nothing of metal or half metal (steel or iron) squares, Nos. 19436 and 2514. Neither does Diderot in 1768. But the square melted "at 2 corners" in a thunder storm at Rutland, Mass., in 1732, according to the *Boston News Letter* of July 6 to 13, of that year, must have been home-made entirely of iron, by a blacksmith. All-steel squares appear in 1813, in the *Circle of Mechanical Arts*, Plate 1, Fig. 9, and as factory-made in the United States in 1834 (imported and domestic, *cf. Bishop*, Vol. II, p. 389). They were also sold at a store in Wilmington, Del., in 1814 (Tryon *Household Manufacturers in United States*, p. 271).

Besides this familiar form Diderot shows a makeshift French carpenters' square, not found by the writer, made by sawing out a rectangle in the end of a board, and the noble little master-

piece of unhonored and forgotten scholarship Rich's *Companion to the Latin Dictionary and Greek Lexicon*, London, 1849, illustrates exactly this latter tool as one form of the Roman "Norma." All the specimens here shown, except the Korean square No. 19254, bought by Rev. Clarence Hoffman, at Kang Kei, Korea, are old Pennsylvania relics.

Another form of this invaluable instrument is the

MITRE OR MITRE SQUARE (Fig. 57)

A mitred wooden block into which a flat blade is vertically fixed which, when set against a straight edge, throws the unscaled blade for pencilling or scribing, at an angle of 45 degrees across the carpenter's work. Since repeated correspondence, searches of shop rubbish and questionings of old carpenters, have failed to find a true example of this now forgotten little tool, we here illustrate it in its old form by a model (middle) from Moxon's picture of 1678. We also photograph from an existing specimen at the Essex Institute, Salem, Mass., a double-armed form of the same tool entirely of wood with its thin arm fixed at the required mitre angle, and finally show the equally effective present form, a common L shaped square in which the end of the thick wooden arm has been mitred at its rectangular junction with its thin steel arm, so that the instrument may be held to line either at 45 or 90 degrees across the work.

But these two angles though the commonest of all, are not enough for the carpenter. Hence the still more effective

BEVEL OR BEVEL SQUARE (Fig. 58)

in which the thin, movable, unscaled wooden arm, here made as Moxon illustrates it, moves stiffly on a rivet in the slotted end of its thick arm. Therefore, when the latter is set against a straight margin, the instrument can throw a line at any desired angle across the wood worked upon. The

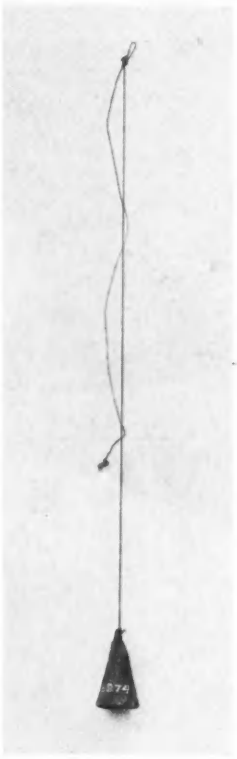


**Fig. 55.—The Plumb Line**

When thus suspended from a fixed point, the string, ending in a leaden plummet, establishes a true vertical line by which the carpenter erects framework, joists, corner overhangs, etc., as described by Moxon in 1678. This specimen, with old home-cast plummet, was bought October, 1897, from Enos B. Loux, of Hilltown, Pa.

**Fig. 56.—The Square**

The Roman "Norma," as described by Vitruvius and Pliny. The instrument here appears in two forms, class (*a*), No. 2514, with one arm thicker than the other, in which case a straight line can be pencilled with the pencil (Fig. 62) or scratched with the scratch awl (Fig. 61) at right angles to the carpenter's work, along the thin, generally unscaled instrument, when its thick arm is set against a straight margin. In this specimen, the thin, unscaled arm, is of iron. In older specimens (not here shown) it appears of wood, and in recent modern examples the iron arm is sometimes scaled. In the other specimens, class (*b*), both arms, scaled to inches, etc., are of equal thickness, when not only the same thing can be done by holding one arm, at a tilt, along the said margin, but also two lines can be drawn at right angles, following both arms of the instrument laid flat on the work. In older specimens of class (*b*), both arms as here shown and as described by Moxon are of wood. In No. 19346, representing nineteenth century examples of this class, both arms are of iron.

bevel and mitre may yield in antiquity to the common square, but the

COMPASS (Figs. 59 A and B)

is the "Circinus" of the Romans. This widely used, many-sized metal tool, by no means confined to the carpenter, consists of two sharp-pointed legs stiffly hinged together on a rivet at their tops, so that one loose point may scratch a circle around the other centred as a pivot. No aesthetic thrill stirs the modern collector, as he looks at this little undecorated instrument,

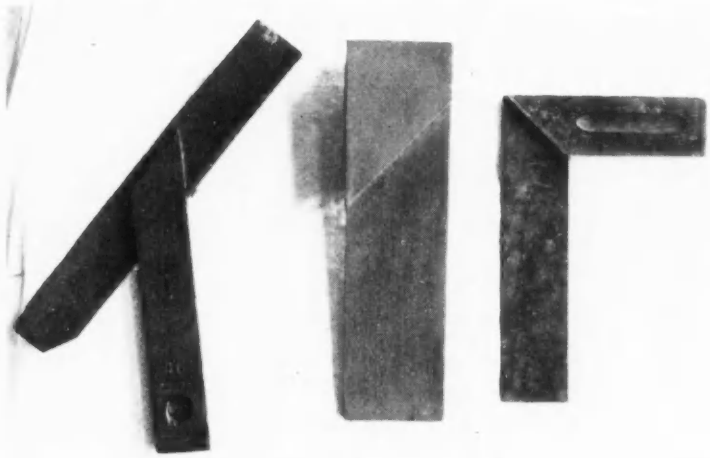


**Fig. 57.—The Mitre or Mitre Square**

For marking woodwork (at a mitre), *i.e.* at an angle of 45 degrees to a fixed margin. The instrument is here shown in three forms.

(*a*) Middle example as illustrated and described by Moxon in 1678, a mitred, wooden block in which a flat, wooden blade is fixed. When the mitred edge of the block is set against a straight edge, the instrument throws the blade for pencilling or scribing at the desired angle of 45 degrees across the carpenter's work. The specimen is shown in a model made from Moxon's description and picture.

(*b*) Left example—a T shaped, old, home-made, all-wood specimen, kindly loaned for illustration by the Essex Institute of Salem, Mass. It shows a thin wooden arm, mortised and pegged into the thick wooden arm at an angle of 45 degrees. The thick arm, just above the hole for suspension, is stamped on both sides with the initials J. L.; also, on the side shown, the marks 3 x 1 x H J S appear on a narrow strip of surface, left slightly above the face level. The Essex Institute has no definite information as to the origin of this old Salem tool.

(*c*) Right example—a rectangular factory-made square now (1925) in use in which the thick wooden arm is mitred at its junction with the iron arm.

If in this ingenious modern tool, the thick arm is laid full-length against an established margin, the iron arm casts a right angle—if only the mitred shoulder at the junction is used, it casts a mitre.

hoary with age—one of the "real things that have no show" in the large pamphlet *Piccoli Bronzi del Real Museo Borbonico*, Carlo Cici, Napoli, 1858, which pictures it in two specimens in bronze, dug up at Herculaneum. Durer's celebrated engraving, "Melancholia," illustrates it in metal, as does Moxon in 1678, Diderot, for France, in 1768, and the *Circle of Mechanical Arts*, for England, in 1813.

By the kind permission of the Rijks Museum at Amsterdam, we here show it again in metal from a store of tools left more than three hundred years ago (in 1596) on the desolate Island of Nova Zembla, and brought back to Amsterdam in 1885. Some of the other specimens here shown in wood (Fig. 59B) were used by Eastern Pennsylvania carpenters in the 18th century, some by Pennsylvania German farmer-carpenters in the last fifty years to decorate wooden barns with ornamental circles, swastikas, etc.

**Fig. 58—The Bevel**

The thin arm of this old instrument, whether home-made of wood, here shown as Moxon illustrates it, or in its later nineteenth century types (Nos. 10176 and 5080, of iron), whether moving stiffly on rivet, or fixed by a thumb screw, is adjustable to any angle which the carpenter wants, to pencil or scratch along it when he holds the thick arm against the margin of his work.

The next illustration shows

THE GAUGE (Fig. 60)

for scratching lines spaced from a fixed margin. From one side of one end of a squared stick, upon which a perforated wooden block slides tightly, a little steel point projects. When the block, moved as far as need be from the point, and fixed by a wedge or thumb screw, is held against and pushed along a straight edge, the down turned point scratches a parallel line at the desired inner distance upon the carpenter's work. The old instruments here shown, one of which, No. 16373 was bought in June, 1919, of John Trumbaur, of Gardenville, Bucks County, Pa., and was used by his father Philip, early in the 19th century, do not differ in construction from the present factory-made tool.

But as the ancient predecessor of the now common carpenter's pencil, another line marking tool has gone out of use in the last twenty years. This is

THE SCRATCH AWL OR SCRIBE AWL OR SCRIBER (Fig. 61)

A thin steel shank with a round point, inserted on a tang in a wooden handle, used not for puncturing wood but for scratching lines established by the rule, square, bevel, etc., on its surface. Whoever confuses it with the brad awl, which superficially resembles it, does not notice or know that its round point will not, like the chisel point of the brad awl, penetrate wood.

The single word "awl," appearing in the *Essex County Probate Records*, may refer to either this tool or the brad awl. The *New English Dictionary* quotes the first use of "scribe" in 1875. Moxon, who speaks of it as a "pricker" and of scratching lines with the compass point and brad awl, does not take the trouble to describe this special scratching instrument. But at last the word "scratch awl" appears in an American hardware list of 1834—*cf.* Bishop, Vol. II, p. 88. Today the never well observed tool is obsolete among carpenters in Eastern Pennsylvania, but survives among cabinet-makers. No. 20269 from Clinton County, Pa., obtained January, 1925, by Col. H. W. Shoemaker, was made by the old mountaineer Seth Nelson, Jr., about 1885, by which time

THE CARPENTER'S PENCIL (Fig. 62)

a strip of sawed native block lead, or later cast powdered lead, alias plumbago, alias, graphite, glued between two strips of wood, was rapidly taking its place. This latter, now universal marking tool, is here shown in its older unpainted, and its later, after *c.* 1900,

**Fig. 59A—The Compass**

The three metal specimens (Fig. 59A) of the sixteenth century, now in the Rijks Museum at Amsterdam, were found in 1885, on Nova Zembla, where they had been stored by a Dutch expedition in 1596.

painted form. It differs conspicuously in its much larger flat lead and broad flat stick, from the common small, round, lead pencil, which must have preceded it; *cf. New English Dictionary*, 1612 and 1683, also *New Dictionary of Arts and Sciences*, 1764, and Reese, *c.* 1800.

In an old inventory of 1677 in the *Essex County Probate Records* the words "27 pensills at 8 d. p. doz.—1 s. 6 d.," seem to refer to it. Nevertheless, Moxon does not mention it. It appears in the *American Hardware List* of 1834, above noted, as of domestic and

**Fig. 59B—The Compass**

The "Circinus" of the Romans. Besides its chief purposes in scratching circles and spacing geometrical patterns, etc., the compass is used to close-fit irregular board margins by "scribing" them. In the latter case, one point of the partially opened tool, held close to and pulled along the rough or waved margin, follows its irregularities, while the other point scratches (scribes) a duplicate, waved line on the close-pushed board. When worked down to this line the board must fit the crooked margin.

The wooden compasses (Fig. 59B), adjustable on sliding arms, are old Bucks County and eastern Pennsylvania specimens. They are often found on farms as heirlooms of farmer-carpenters, and are sometimes still used by the latter, if Pennsylvania Germans, to outline the decorative painted circles, stars, swastikas, etc., conspicuous since the mid-nineteenth century on their wooden barn fronts.

Among these, No. 16565 (lower left), presented by Dr. B. F. Fackenthal, Jr., was bought at the sale of George W. Laubach, 88 years old, in 1919, at Riegelsville, Pa.

imported make (Bishop, Vol. II, p. 388), and must have gradually thereafter rivalled without ousting the scratch awl. Lewis Treffinger, a carpenter of Doylestown, Pa., informed the writer in April, 1925, that his father, a carpenter in the 1880's, refused to replace his scratch awl with the pencil, and we learn from David Angeny, carpenter, of Danboro, Pa. (1925) that because the older unpainted pencils were easily lost in the shavings and litter of a carpenter's shop, the present brightly painted instrument, gradually replaced the paintless in the 1890's.

Another now very familiar instrument of the wood-worker is

### The Rule (Fig. 63)

a pocket instrument scaled in inches, half inches, quarters, and eighths, which, though in general use among mechanics, was and is incessantly employed by the carpenter for measuring and line ruling his work. Moxon in 1678 illustrates it in its old form as a single foot-long stick; *The Circle of*

**Fig. 60.—The Gauge**

When this block or strip, adjustable by a thumb screw and sliding back and forth on a square stick, is held against an established margin, an iron pin set at the end of the stick scratches a line parallel to said margin on the carpenter's work. It is often used to mark mortise holes. These wooden tools are all home-made and represent the pre-factory (*c.* 1840) period. In all, the block is fixed by a thumb screw of brass (left) or of iron (lower right), otherwise of wood, except in the two upper right specimens, in which it is tightened, as Moxon describes, with a wedge. Sometimes the blocks are round or oval. No. 5457, included by mistake, is not a gauge, but a knife, shiftable by a wedge, probably used for slicing leather.

*Mechanical Arts* in 1813, as brass tipped and brass hinged in two six inch arms; and the evidence shows that the present factory-made joint rule of box or hard wood, 24 inches long, in four folding, brass-tipped arms, at first imported and later American made, appeared about 1840.

Besides this tool the carpenter continually makes for himself now, as he did in Colonial times, a thin wooden strip for long measurements notched or marked into ten foot long divisions, not here shown, called

THE TEN FOOT RULE

described but not illustrated by Moxon.

This brings us to another instrument which, if not more important, is cer-

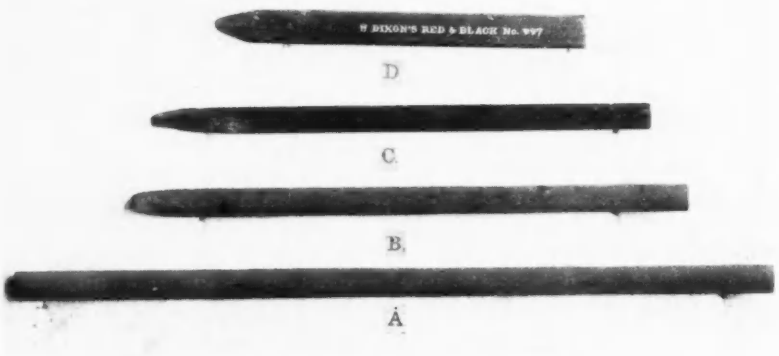



**Fig. 62.—The Carpenter's Pencil**

A strip of sawed native, or later cast, block lead, alias plumbago, alias graphite, glued between two strips of wood.

**Fig. 61.—The Scratch Awl or Scribe**

**Awl or Scribe**

As the ancient predecessor of the carpenter's pencil, this now obsolete, thin, steel shank, inserted on a tang, in a wooden handle, which but for its round point resembles the brad awl, was used for scratching lines, established by the rule, square, bevel, etc., on wood work, until the mid-nineteenth century, after which, except rarely with cabinetmakers, the pencil superseded it.

(A) kindly loaned for this illustration by the Essex Institute, of Salem, Mass.,Museum No. 108860, blue stamped "A. W. Faber," on one side, with the red stamped words "Bleistift Manufactur" on the other side, here shows the carpenter's pencil is its early, unpainted, imported German form.

(B) also unpainted, marked "Eagle, pat. 1862-1867-1876" is from Manheim, Pa.

(C) varnished, stamped, "Eagle, pat. Apr. 3, 1860," was found *c.* 1914, in an old workshop at 2512 N. Hancock St., Philadelphia, Pa.

(D) painted red with black corners, as now in use, is stamped "E. W. Foster, Frankford Avenue, Philadelphia."

The dictionaries do not tell us when the lead pencil was first specially made for carpenters' use, but only that the modern lead pencil, in general, was first made of sawed strips of native graphite from the Borrowdale (Cumberland, England) mines, discovered 1664 and exhausted *c.* 1850. That the cast graphite, powder-mixed-with-clay-process, discovered by Conté in 1795, revolutionized the industry. That the Fabers started pencil manufacturing at Nuremburg and vicinity in 1760, and in 1847 began the use of the Siberian graphite at the Bogodolsk mine in Eastern Siberia, some of which raw material was sawed native. That Faber founded a branch in New York in 1861, after which the Eagle and American Pencil Cos., were established in 1865, and the Dixon Co. in 1872.

tainly far more ingenious than the rule, namely

THE LEVEL (Fig. 64)

all the more interesting because, as the "Libella" of the Romans, it is one of those tools which maintained their ancient form for two thousand years and then suddenly changed it when the so called "Industrial Revolution" modernized industries in the 19th century.

When this home-made semi-circle is set upright on a piece of carpenter's work, so that the string on its leaden plummet, suspended from its top centre, coincides with a vertical line or crack marked on its centre piece, the work is level. From two to ten feet long, these primeval tools vary in construction as semicircles or triangles, or L's or T's. As illustrated by Moxon they exactly resemble the Roman "Libella" of Lucretius, Pliny and Varro, and must have been universally used by carpenters throughout the Middle Ages. They survived as above noted, until early in the 19th century, when the spirit level (Figure 66, *cf.* Reese) was at last sufficiently cheapened by factories to take their place. The specimen shown was presented August 1, 1924, by Howard Cope, of Sellersville, and had been sold by his father's estate, after the latter's death about 1915. Another example of the same tool appears in

THE LEVEL (Fig. 65)

which in the form of a wooden T differs in shape, but not in principle, from the preceding. It was bought from Miss A. H. Swartz, Point Pleasant, Bucks County, Pa., in 1916, and was found among her father's old shop relics. Long before this, as above noted, it and

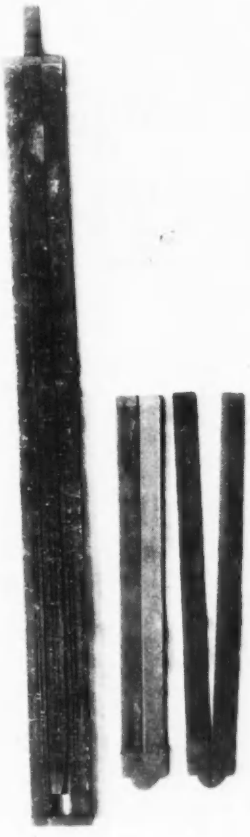


**Fig. 63.—The Carpenter's Rule**

In the seventeenth century, a flat, home-made, straight-edged wooden strip, either one or two feet long, scaled to inches, halves, quarters and eighths. Factory-made in the nineteenth century, it became hinged, first in two, and later, as now, into four brass-tipped, box-wood sections.

The two twelve-inch long (when extended), double-armed specimens, kindly loaned for this illustration by David Angeny, carpenter, of Danboro, Bucks Co., Pa., are still in use by him. The rule at the left, with a central sliding arm, extensible to twenty-four inches, is an eccentric American instrument, not typical of its class and without record in the Museum.

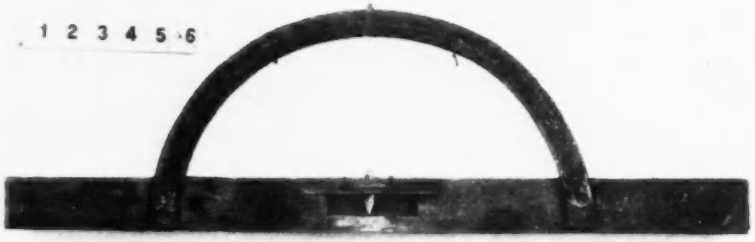



**Fig. 64.—The Level**

The "Libella" of the Romans, the predecessor, before *c.* 1830-1840, of the present carpenter's spirit level. When the suspended string with its leaden plummet, of this home-made, wooden semi-circle set upright on a piece of carpenter's work, coincides with a vertical line or crack marked on its cross piece, above the swing-hole, the work is level. These home-made instruments, in universal use in the eighteenth century, from two to ten feet long, vary in construction as triangles or L's or T's.

This specimen, No. 19469, was presented to the Museum of the Bucks County Historical Society, August 1, 1924, by Howard Cope, of Sellersville, Bucks Co., Pa. It was sold by his father's estate after the latter's death about 1915, and later repurchased by Howard Cope to present to the Museum. Pointed wood screws used in its construction date it after 1846.

its predecessor (Fig. 64) had been superseded by the

SPIRIT LEVEL (Fig. 66)

This is a glass tube partly filled with spirits (alcohol) set horizontally in a strip of wood, which, if laid on the carpenter's work, levels the latter when the confined bubble rests at the marked middle of the tube. Delicate, expensive, and at first somewhat inaccurate, the device, invented as before mentioned, according to Reese, by Thevenot in 1666, or Dr. Hooke, *c.* 1680, and sometimes used in the 18th century by surveyors, etc., is not classed as a carpenter's tool by Reese, *c.* 1800, and not illustrated as such by the *Circle of Mechanical Arts* in 1813, which shows only the old plumb level (*see* Fig. 62). Moreover, as the very exact making, filling, sealing and setting of its glass tube put it beyond the home craft of the carpenter, the evidence shows that it was factory made from the start and not adopted by carpenters until its manufacture had been as above noted, simplified and cheapened by factories in the middle 19th century.

At this point two makeshift levelling instruments, not here illustrated, ought to be described, namely,

THE STRAIGHT EDGE

a long narrow board, still continually used, with one level-planed edge, or with its two straight planed edges exactly parallel, used to ascertain surface irregularities, establish elevations from point to point and to project the line of the carpenter's level set upon or under it, and

THE TRYING STICKS

two or more, now obsolete, smaller, shorter, makeshift strips, similarly double straight-edged, used as Moxon

**Fig. 65.—The Level**

In this old Bucks County specimen, No. 5429, which differs in shape, but not in principle, from the preceding, the plummet is suspended from the top of the vertical arm. It was bought in 1916, from Miss A. H. Swartz, of Point Pleasant, Bucks Co., Pa. when found in an old carpenter and wheelwright shop, among the many obsolete tools of her deceased father.

and Reese describe, as sights, to detect the so-called "windings," namely twists, warpings, etc., on supposed levels, for which purpose they were laid parallel at several feet apart, across planed board surfaces, and top-sighted by the carpenter.

This brings us to the end of a group of tools here classed as devoted to the measuring and adjustment of the carpenter's work, which though insignificant in appearance, are most important in fact, and appear everywhere about a carpenter's shop and bench, stock his chest, and follow his work from one end of a new building to another.

*(To be continued)*

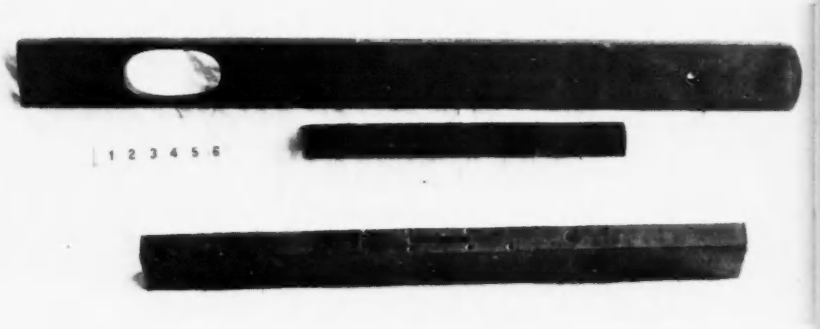



**Fig. 66.—The Spirit Level**

A glass tube partly filled with spirits (alcohol) is set lengthwise on the narrow side of a long strip of wood. When the strip is laid edgewise, horizontally on the carpenter's work, and the confined bubble rests at the marked middle of the tube, the work is level. The lower brass-mounted specimen is a factory-made instrument, about fifty years' old, kindly loaned for the illustration and now in use (1925) by Lewis Treffinger, carpenter of Doylestown, Pa.

The very interesting, apparently home-made small level (middle), kindly loaned by the Essex Institute, Salem, Mass., Museum No. 101227, entirely lacking marks or mid-score, consists of a glass tube, now dry, showing the remains of an enclosed red fluid. The tube is tightly inserted in a top slot, here turned sideways to be seen, in a 15 in. by 1⅜ by 1⅜ in. strip of dark, heavy wood. The glass, deeply underset in the slot at either end, contains a loose, black plug, apparently tipped with red sealing wax. It came from an old house in East Lexington, Mass., belonging to Miss Ellen M. Stone, there found with a store of old household relics. If the instrument is a carpenter's level at all, it probably represents an early 19th century experimental attempt to produce the tool.

The upper specimen with a bubble glass, faintly seen, inserted on its narrow side, shows on its wide face a centred, vertical scratch above a swing-hole to clear the plummet, and ending in a notch for the string. Hence the instrument is a spirit level, if held horizontally, if vertically, a plumb level. A brass plate over the bubble glass, fixed with pointed wood screws, and therefore after their invention in 1846, is marked Disston and Morss. Loaned for the illustration by Mr. H. M. Mann, of Doylestown. It was found at No. 2512 N. Hancock St., Philadelphia, among a store of old inherited tools, probably bought about 1875. According to information just received from Mr. S. Horace Disston of the firm of Henry Disston and Sons of Philadelphia, the level is a bricklayers' level, "not used by the carpenter at all," and must have been made by his firm, then under the name of Disston and Morss, between 1868 and 1901.